

CLAIMS

What is claimed is:

1. A fusion reactor assembly, comprising:
a substantially spherical body adapted to contain working fluid in a working space which is closed to ambient;
at least one actuator contained by the substantially spherical body to generate at least one pressure wave in the working fluid; and
means for amplifying the at least one pressure wave in the working fluid such that an amplified pressure wave deforms the actuator to generate electrical energy.
2. A fusion reactor as recited in claim 1, wherein the at least one actuator is a piezo material capable to converting compressive force into electrical energy.
3. A fusion reactor of claim 2, wherein the at least one actuator is segmented.
4. A fusion reactor of claim 3, wherein the segments allow contraction of the at least one actuator in a tangential direction.

5. A fusion reactor of claim 3, wherein each of the segments has a hexagonal shape.

6. A fusion reactor of claim 3, wherein the segments have a gap therebetween.

7. A fusion reactor of claim 3, wherein the segments are separately controlled with time delays to improve a focus of the pressure wave in a center of the working space.

8. A fusion reactor of claim 1, wherein the substantially spherical body includes an inner wall and an out wall, the at least one actuator is housed between the inner wall and the outer wall.

9. A fusion reactor of claim 1, wherein the at least one actuator is at least one magneto restriction actuator which has a space between an inner wall and an outer wall of the substantially spherical body.

10. A fusion reactor of claim 1, wherein the at least one actuator is a solenoid actuator and the solenoid actuator is connected with an outer wall and an inner wall of the substantially spherical body and between poles.

11. A fusion reactor of claim 1, wherein the working fluid contains deuterium-tritium gas in solution.

12. A fusion reactor of claim 1, wherein the amplifying means includes at least one deuterium-tritium gas bubble compressed by the pressure wave to generate the amplified pressure wave.

13. A fusion reactor of claim 12, wherein the at least one deuterium-tritium gas bubble is provided by a fluid jet through a center of the working space.

14. A fusion reactor of claim 12, wherein the at least one deuterium-tritium gas bubble includes oxygen.

15. A fusion reactor of claim 1, wherein the amplifying means generates a negative pressure wave compared to residual pressure to generate deuterium-tritium gas bubbles in a center of the working space.

16. A fusion reactor of claim 1, wherein the at least one actuator generates a pressure wave to compensate for deformations of a previous generated pressure wave caused by pressure dependent sound speeds of the working fluid.

17. A fusion reactor of claim 1, wherein the at least one actuator actuates with natural frequency or a multiplicity of the natural frequency of the working fluid and amplifies the at least one pressure wave step by step until pressure spikes in a center of the working space start a nuclear fusion.

18. A fusion reactor of claim 1, wherein the working fluid is water.

19. A fusion reactor of claim 1, wherein the working fluid is pressurized to a constant level of about 0.05 Mpa to 5 Mpa.

20. A fusion reactor of claim 1, wherein one of (i) an outer wall of the substantially spherical body is deformed to optimize a focus of the at least one pressure wave in a center of the working space and (ii) hydraulic piston-barrel elements optimize a focus of the at least one pressure wave in the center of the working space.

21. A fusion reactor of claim 1, wherein one or more pressure sensors sense and provide control feedback to a control and power unit to control a focus of the at least one pressure wave in the center of the working space.

22. A fusion reactor of claim 1, further comprising:

a control and power unit activating the at least one actuator to generate the at least one pressure wave in the working fluid; and

a conditioning system providing stable pressure and temperature conditions of the working fluid,

wherein the control and power unit uses one or more pressure sensors, a pressure pump and an external reservoir to control residual pressure of the working fluid within the working space.

23. A fusion reactor of claim 1, further comprising:

a control and power unit activating the at least one actuator to generate the at least one pressure wave in the working fluid; and

a conditioning system providing stable pressure and temperature conditions of the working fluid,

wherein the control and power unit uses one or more temperature sensors, a secondary fluid circuit with a pump, a heat exchanger and the conditioner to control the temperature of the working fluid within the working space.

24. A fusion reactor of claim 23, wherein the conditioner provides at least one of (i) calibrated deuterium-tritium gas bubbles for the amplifying means or a predetermined amount of soluble deuterium-tritium gas in the working fluid and (ii) removes helium from the working fluid.

25. A fusion reactor of claim 1, further comprising a power unit to apply an electrical voltage to connectors of the substantially spherical body, the electrical voltage provides an electrical field which lengthens the at least one actuator to begin generating a pressure within the working space.

26. A fusion reactor of claim 25, wherein the at least one actuator compresses an inner wall of the working space with a speed of approximately 2 m/s.

27. A fusion reactor of claim 1, wherein an outer wall of the substantially spherical body prevents deformations from stress and an inner wall of the substantially spherical body has flexible wall thickness.

28. A fusion reactor of claim 1, wherein the amplifying means includes gas bubbles in a center of the working space provided by one or more inlet tube located in a radial arrangement to the working space which are compressed by the pressure wave.

29. A fusion reactor of claim 28, wherein the one or more inlet tube has a conical shape tip.

30. A fusion reactor of claim 1, further comprising means for activating the actuator to generate an initial pressure wave in the working fluid.

31. A fusion reactor assembly, comprising:

a substantially spherical body having an inner wall and an outer wall, the inner wall adapted to contain working fluid in a working space which is closed to ambient;

at least one actuator contained between the inner wall and the outer wall, the at least one actuator generating at least one pressure wave in the working fluid;

a control and power unit activating the at least one actuator to generate the at least one pressure wave in the working fluid;

a conditioning system providing stable pressure and temperature conditions of the working fluid; and

means for supplying a gas bubble into the center of the substantially spherical body which intersects with the at least one pressure wave, wherein

the at least one pressure wave compresses the gas bubble which, in turn, amplifies the at least one pressure wave, and

the amplified pressure wave reflects on the inner wall and deforms the actuator to generate electrical energy.

32. A fusion reactor of claim 31, wherein the at least one actuator is a piezo material.

33. A fusion reactor of claim 32, wherein the piezo material is segmented, the segments allow contraction of the at least one actuator in a tangential direction and are separately controlled with time delays to improve a focus of the pressure wave in a center of the working space.

34. A fusion reactor of claim 31, wherein the at least one actuator is one of (i) a magneto restriction actuator which has a space between the inner wall and the outer wall of the substantially spherical body and (ii) a solenoid actuator and the solenoid actuator is connected with the outer wall and the inner wall of the substantially spherical body and between poles.

35. A fusion reactor of claim 31, wherein the working fluid contains at least deuterium-tritium gas in solution.

36. A fusion reactor of claim 31, wherein the amplifying means includes at least deuterium-tritium bubbles compressed by the at least one pressure wave to generate the amplified pressure wave.

37. A fusion reactor of claim 31, wherein the amplifying means generates a negative pressure wave compared to residual pressure to generate deuterium-tritium bubbles in a center of the working space.

38. A fusion reactor of claim 31, wherein the at least one actuator actuates with natural frequency or a multiplicity of the natural frequency of the working fluid and amplifies the at least one pressure wave step by step until pressure spikes in a center of the working space start a nuclear fusion.

39. A fusion reactor of claim 31, wherein one of (i) the outer wall is deformed to optimize a focus of the pressure wave in the center of the working space and (ii) hydraulic piston-barrel elements optimize a focus of the pressure wave in the center of the working space, and one or more pressure sensors sense and provide control feedback to the control and power unit to control a focus of the pressure wave in the center of the working space.

40. A fusion reactor of claim 31, wherein :
the control and power unit uses one or more pressure sensors, a pressure pump and an external reservoir to control residual pressure of the working fluid within the working space, and

the control and power unit uses one or more temperature sensors, a secondary fluid circuit with a pump, a heat exchanger and the conditioner to control the temperature of the working fluid within the working space.

41. A fusion reactor of claim 40, wherein the conditioner provides at least one of (i) calibrated deuterium-tritium gas bubbles for the amplifying means or a predetermined amount of soluble deuterium-tritium gas in the working fluid and (ii) removes helium from the working fluid.

42. A fusion reactor of claim 31, wherein the amplifying means includes gas bubbles in a center of the working space provided by one or more inlet tubes located in a radial arrangement to the working space which are compressed by the pressure wave.

43. A method of providing a fusion reaction in a substantially spherical body closed to ambient to generate electricity, the method comprising the steps of:

providing a working fluid;

providing a gas bubble in the working fluid;

generating a pressure wave in the working fluid that intersects with the gas bubble;

compressing the gas bubble with the pressure wave to increase a temperature and pressure of the gas bubble creating a thermal reaction and triggering a fusion reaction of

material comprising the gas bubble; and

amplifying the pressure wave which then deforms an actuator material to generate electricity.

44. The method of claim 43, wherein the gas bubble is composed of at least deuterium and tritium and the working fluid is at least water.